

**REMARKS**

Reconsideration is requested for claims 1-21.<sup>1</sup>

The drawings were objected to under 37 C.F.R. § 1.83(a) on the grounds that they do not show every feature of the invention specified in the claims. Specifically, it was asserted in the Official Action that the drawings do not show that electrical supplies of the stator sections have been shifted 180° electrical relative to electrical supplies of every tooth of a second set of every tooth of the stator sections. A Request for Approval of New Drawing Figure accompanies the present response and includes proposed new FIG. 5 that shows the subject matter in question. Withdrawal of the objection is cordially urged.

The drawings were also objected to on the grounds that they fail to show clearly the scope of the invention. Specifically, it was asserted that the tip of the teeth axially extending past the main part of the teeth at least at one of the axial sides thereof. It is respectfully submitted that this subject matter is illustrated in FIG. 2, and described in the text at Page 4, line 36, to Page 5, line 1.

Claims 1-21 were rejected under 35 U.S.C. § 112, second paragraph, on formal grounds. It was questioned whether the "electrical supplies" can be illustrated and what they are. It is respectfully submitted that the foregoing is not an appropriate basis for a rejection under 35 U.S.C. § 112, second paragraph. New FIG. 5 schematically illustrates

---

<sup>1</sup> It is noted that, in the Preliminary Amendment filed October 10, 2000, new claims 11-20 were added. These claims were improperly numbered because original claim 11 already existed. Apparently, new claims 11-20 were renumbered claims 12-21. Claims 1-21 as presently understood to be pending -- and including amendments made by the present Amendment -- are presented in full in this Amendment. In the event that the Examiner believes the status of the claims to be other than as indicated herein, the Examiner is requested to advise the undersigned.

an electrical supply, which is submitted to be something that is well-known to persons skilled in the art. The Examiner is requested to advise the undersigned if it is still considered to be unclear what is meant by "electrical supply."

The Official Action also inquires what is meant by the language about the stator sections being shifted 180° electrical relative. Claim 1 actually recites electrical supplies of every tooth of a first set of  $n/2$  of the stator sections is shifted 180° electrical *relative to electrical supplies of every tooth of a second set of  $n/2$  of the stator sections*. The feature of claim 1 stating "*wherein the stator sections are mutually and physically phase shifted by substantially  $360^\circ/n$  electrical  $\pm$  an angle related to skew*",  $n$  being the number of stator sections, may be seen as defining the position of the teeth of one stator section relative to corresponding teeth of another stator section. This is shown in FIG. 5 wherein teeth 7a, 7b, and 7c, respectively, of the second stator section are positioned differently from the corresponding stator teeth 6a, 6b, and 6c, respectively, of the first stator section. As clearly seen from the figure this structural specification, when applied to a stator comprising two stator sections, results in the two stator sections being physically turned 180° in respect of each other. The variable  $n$  is a static value and, thus, the positional relation between corresponding teeth of different stator sections is static. The electrical supplies are simply the means providing electricity to the windings of the induction machine in order to make the induction machine run.

Further, claim 1 states that "*electrical supplies of every tooth of a first set of  $n/2$  of the stator sections is shifted 180° electrical relative to the electrical supplies every tooth of a second set of  $n/2$  stator sections*". This may, for example, be achieved by alternating the

supply wires connected to the winding of each tooth of a first set of stator sections relative to the supply wires connected to the windings of the teeth of a second set of stator sections, but it may also be seen as a phase shift operation performed on the electrical supply.

Accordingly, this feature of the claim defines the configuration of the electrical supplies of a specific set of stator sections as a relation to the configuration of the electrical supplies of another set of stator sections. In FIG. 5 one embodiment of this relation is shown for a stator having two stator sections, i.e., the first set of stator sections and the second set of stator sections each contains one stator section. As seen in FIG. 5 the electrical supply wires connected to a tooth 7a of the second stator is alternated in relation to the electrical supply wires connected to the corresponding tooth 6a of the first stator. This feature is also static in respect of the relation between the stator sections of the two different sets of stator sections, i.e., the phase shift of 180° between a tooth of the first set of stator sections and a tooth of the second set of stator sections will not change during operation of the induction machine.

Claims 1-3, 9-12, and 19-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,652,493 to *Hendershot* in view of U.S. Patent No. 6,031,304 to *Suzuki et al.* *Hendershot* discloses a direct current motor in the form of an Switched Reluctance (SR) motor. A SR motor is driven by a switched field that is generated by subsequent excitation of poles of a stator. *Hendershot* discloses a first and a second stator mounted on the same axle. The second stator is rotationally skewed in relation to the first stator by 22.5°. The rotation is attained by sequentially energizing a first phase of the first stator, then energizing a first phase of the second stator, then

energizing a second phase of the first stator, and then energizing a second phase of the second stator.

Thus, *Hendershot* does not disclose an induction machine but a totally different kind of machine, one of the most evident differences is that the induction machine is an alternating current (a.c.) machine. Further, neither does *Hendershot* disclose that *stator sections are mutually and physically phase shifted by substantially  $360^\circ/n$  electrical  $\pm$  an angle related to skew* nor does *Hendershot* disclose a *shifting of the electrical supplies of every tooth of a first set of  $n/2$  stator sections by  $180^\circ$  electrical relative to the electrical supplies of every tooth of a second set of stators.*

evening  
}

✓

Nothing in *Hendershot* indicates that the description is valid for any other types of electrical machines, especially not induction machines. To alter the device of *Hendershot* and achieve the invention according to claims 1 or 11 the person skilled in the art would have to convert the SR motor to an induction machine and add the features specified above. *Hendershot* does not disclose or suggest how this would have been done.

*Suzuki et al.* discloses a claw pole type stepping motor. Such a motor is, per definition, formed by an assembly of two stator yokes with axially extended teeth, "claws", overlapping each other in the axial direction. The rotor of the motor is a permanent magnet. *Hendershot* discloses an arrangement of a first and a second stator, each including a coil having an assemble of two stator yokes, wherein the second stator is disposed like turning the first stator upside down which results in a phase difference of  $90^\circ$  in electrical angle between the first and the second stator (see column 4, line 36-41). In order to cancel tertiary high harmonic waves induced in the stator pool teeth the geometry of the teeth are

changed. The change of geometry makes the tertiary high harmonic waves induced in the teeth of the two stator yokes, respectively, deviate from each other by 180 degrees in electrical, thus canceling each other.

Thus, *Suzuki et al.* does not disclose an induction machine but a claw pole type stepping machine. Further, neither does *Suzuki et al.* disclose that each tooth has a single winding, that stator sections are mutually and physically phase shifted by substantially  $360^\circ/n$  electrical  $\pm$  an angle related to skew, nor does *Suzuki et al.* disclose a shifting of the electrical supplies of every tooth of a first set of  $n/2$  stator sections by  $180^\circ$  electrical relative to the electrical supplies of every tooth of a second set of stators.

*Hendershot does!*

There is nothing in *Suzuki et al.* that would have suggested to one of ordinary skill in the art a combination with *Hendershot*. The fact that the motors of *Hendershot* and *Suzuki et al.* are totally different types makes the combination even more unlikely. Furthermore, it seems even more unlikely that a person skilled in the art would have combined features of two totally different motor types and utilized the combination in a third type of electrical machine, which is of a type that is totally different from both the others. Further, even if, for the sake of argument only, a skilled person would somehow have combined features of *Suzuki et al.* with features of *Hendershot*, the result still would not have been the invention according to claim 1, at least because the combination would not include all of the features of claim one.

In view of the differences between claims 1 and 11 and *Hendershot* in view of *Suzuki et al.*, it is respectfully submitted that claims 1 and 11 and the claims dependent therefrom define patentably over the cited references.

Claims 4 and 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hendershot* in view of *Suzuki et al.* and JP 406245456A (*Taguchi*). *Taguchi* was cited as allegedly disclosing a stator made of magnetic powder. *Taguchi* cures none of the defects of *Hendershot* in view of *Suzuki et al.* discussed above with regard to claim 1, from which claims 4 and 13-15 depend. Accordingly, claim 1 and the claims dependent therefrom, including claims 4 and 13-15, are submitted to define patentably over *Hendershot* in view of *Suzuki et al.* and *Taguchi*.

Claims 8, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hendershot* and *Suzuki et al.* in view of U.S. Patent No. 5,763,978 to *Uchida et al.* *Uchida et al.* was cited as allegedly disclosing an electrical machine with tips of teeth that extend axially. *Uchida et al.* cures none of the defects of *Hendershot* in view of *Suzuki et al.* discussed above with regard to claim 1, from which claims 8, 17, and 18 depend. Accordingly, claim 1 and the claims dependent therefrom, including claims 8, 17, and 18, are submitted to define patentably over *Hendershot* in view of *Suzuki et al.* and *Uchida et al.*

Claims 5-7 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hendershot* in view of *Suzuki et al.* and *Taguchi* and U.S. Patent No. 6,049,153 to *Nishiyama et al.* *Taguchi* was cited as allegedly disclosing a stator made of magnetic powder as recited in claim 4. As noted above, *Taguchi* cures none of the defects of *Hendershot* in view of *Suzuki et al.* discussed above with regard to claim 1, from which claim 4 depends and, accordingly, claim 1 and the claims dependent therefrom, including claim 4, are submitted to define patentably over *Hendershot* in view of *Suzuki et al.* and

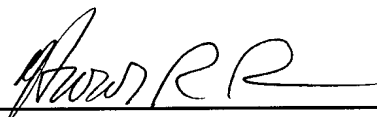
*Taguchi*. *Nishiyama et al.* was cited as allegedly disclosing stator sections made of separated units. *Nishiyama et al.* cures none of the defects of *Hendershot* in view of *Suzuki et al.* and *Taguchi* discussed above with regard to claims 1 and 4, from which claim 5-7 and 16 depend and, accordingly, claims 1 and 4 and the claims dependent therefrom, including claim 5-7 and 16, are submitted to define patentably over *Hendershot* in view of *Suzuki et al.*, *Taguchi* and *Nishiyama et al.*

It is respectfully submitted that all of the pending claims, claims 1-21, are in condition for allowance. Allowance is cordially urged.

If the Examiner should be of the opinion that a telephone conference would be helpful in resolving any outstanding issues, the Examiner is urged to contact the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:   
Harold R. Brown III  
Registration No. 36,341

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620

Date: August 20, 2002